

CASE STUDY //
RESTORATION IN MADAGASCAR

© Conservation International / photo by Narindria Ranaivoson Andriambala

November 2022



CONTEXT

Madagascar's Ministry of Environment and Sustainable Development, the Ministry responsible for protected area governance, is committed to greening the island. The Ministry recommends increasing the rate of reforestation and restoration for all ecosystems (terrestrial, coastal, marine, freshwater and inland water). The island is among the countries vulnerable to climate change due to deforestation from illicit exploitation, fire and agricultural practices.

After establishing the National Strategy on Forest Landscape Restoration and Green Infrastructure in 2017, Madagascar became a member of the African Forest Landscape Restoration Initiative (AFR100). In order to fulfil the AFR100 commitment, the national Forest Landscape Restoration Committee and platform was created in 2016. It is intersectoral involving the Ministries of Environment, Agriculture, Water, Energy and Hydrocarbons, as well as Land Use Planning. Madagascar aims to restore 4 million hectares by 2030 for ecosystems to be resilient and multifunctional while ensuring economic development.

The objectives of AFR100 are aligned with national priorities related to the improvement of affordable energy for the rural population, the sustainability of ecosystem services and their benefits to people such as carbon, water, food and biodiversity. It is a multisectoral and interdepartmental approach.

Greening Madagascar is a Government priority and is led by the Ministry of Environment and Sustainable Development, the Ministry responsible for the management of protected areas in Madagascar. See the map on the following page for the Ministry's reforestation achievements.



The goal of Madagascar's Ministry of Environment and Sustainable Development is to:



REACHING MADAGASCAR'S COMMITMENT /

The Ministry requests that managers of protected areas restore and reforest at least 1% of their protected area per year to reach this goal. Each year the protected area managers submit a report to the Ministry for their restoration progress and describe the challenges they faced if they were not able to reach the annual objective.

Restoration takes place during the wet season from December to April. Three months before restoration begins plant nurseries are established for different species. These are mostly indigenous and endemics, but there are some other plant species frequently used for the daily needs of the population for energy, construction and food. In addition, specific species are used for the restoration of freshwater ecosystems such as lakes, rivers and watersheds. The most successful is the mangrove restoration.

RESTORATION ACTIVITIES IMPLEMENTED BY CONSERVATION INTERNATIONAL (CI) MADAGASCAR /

CI Madagascar has **three main sites** (see pages 3-5) composed of **three protected areas**, two terrestrial and one marine. CI Madagascar manages these protected areas under category V of the International Union for Conservation of Nature (IUCN) Management Guidelines through a co-management approach with the local communities. Restoration of the three protected areas is a commitment of CI Madagascar to the Ministry of Environment and Sustainable Development.

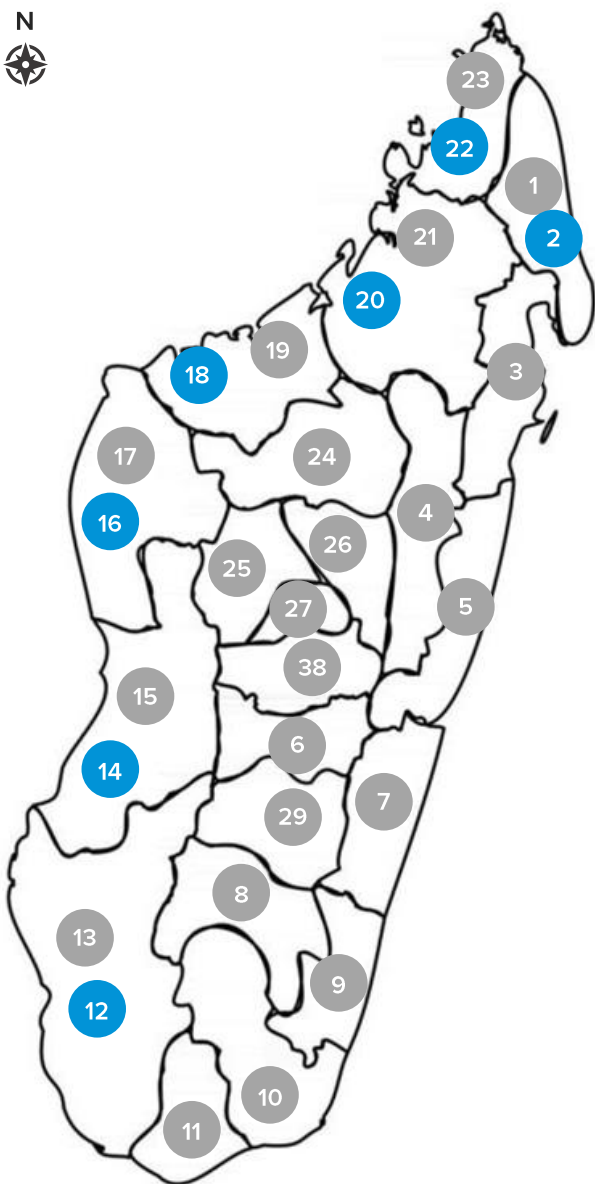
REFORESTATION ACHIEVEMENT

per regional directorate of Madagascar's Ministry of Environment and Sustainable Development

The table on the right shows the name of the Region/Regional Directorate of Environment and Sustainable Development responsible for the reforestation. It also shows the hectares achieved and the percentage of the objective achieved.

LEGEND

- Mangrove reforestation
- Terrestrial reforestation



- 1 **SAVA:** Achieved 252.56 ha (10.7%)
- 2 **SAVA:** Achieved 2 ha (3.33%)
- 3 **ANALANJIROFO:** Achieved 228.66 ha (6.7%)
- 4 **ALAO TRA MANGORO:** Achieved 1,077.31 ha (21.8%)
- 5 **ATSINANANA:** Achieved 319.27 ha (16.65%)
- 6 **AMORON'I MANIA:** Achieved 566.44 ha (47.92%)
- 7 **VATOVAVY FITOVINANY:** Achieved 351.64 ha (23.79%)
- 8 **IHOROMBE:** Achieved 884.96 ha (54.63%)
- 9 **ATSIMO ATSIANANA:** N/A
- 10 **ANOSY:** Achieved 86.87 ha (8.16%)
- 11 **ANDROY:** Achieved 79.8 ha (7.67%)
- 12 **ATSIMO ANDREFANA:** Achieved 75.84 ha (65.95%)
- 13 **ATSIMO ANDREFANA:** Achieved 1,337.22 ha (46.74%)
- 14 **MENABE:** Achieved 86.64 ha (40.3%)
- 15 **MENABE:** Achieved 425.21 ha (28.16%)
- 16 **MELAKY:** Achieved 317.12 ha (42.34%)
- 17 **MELAKY:** Achieved 355.82 ha (19.18%)
- 18 **BOENY:** Achieved 2,467.96 ha (18%)
- 19 **BOENY:** Achieved 968.85 ha (12.26%)
- 20 **SOFIA:** Achieved 75 ha (10.56%)
- 21 **SOFIA:** Achieved 1,222.64 ha (19.36%)
- 22 **DIANA:** Achieved 288.35 ha (71.2%)
- 23 **DIANA:** Achieved 415.08 ha (17.48%)
- 24 **BETSIBOKA:** Achieved 118.72 ha (5.91%)
- 25 **BONGOLAVA:** Achieved 640.32 ha (51.93%)
- 26 **ANALAMANGA:** Achieved 1,994.24 ha (103.6%)
- 27 **ITASY:** Achieved 1,893.89 ha (121.72%)
- 28 **VAKINANKARATRA:** Achieved 6,150.04 ha (97.99%)
- 29 **HAUTE MATSIATRA:** Achieved 2,072.01 ha (49.62%)

Source: <https://www.environnement.mg/wp-content/uploads/2021/06/Lettre-information-MEDD-MARS-2021V2.pdf>

1

Forest corridor Ambositra-Vodrozo (COFAV)

The anthropic pressures in COFAV are mainly due to the conversion of forest into cultivation land through tavy – a slash and burn agricultural practice. To break this cycle, forest restoration activities were carried out.








NURSERYPERSONS AND PUBLIC TRAINING ON RESTORATION ACTIVITIES / 52

nurserypersons were identified in 2021. The main services provided by these nurserypersons are 1) the establishment of nurseries to produce seedlings according to the required technical standards, 2) the production of seedlings in the necessary number and with the necessary vigor and size for survival after planting, 3) the monitoring and survival of the planted seedlings and 4) participation in activities subsequent to the production of seedlings. The nurserypersons were employed for **10 days per month** during the establishment and monitoring of nurseries.

NURSERY MONITORING / 32 nurseries

were established in 2021. These nurseries produced **95,146 seedlings** of indigenous and non-indigenous species as well as fruit trees. The forest species produced were: Harungana, Menahy, Rotra, Hazombato, Hafotra, Kimba, Varongy, Tavolo and Sambalahy. The only non-indigenous species was acacia. Within the framework of the Sustainable Landscapes of Eastern Madagascar project¹, the reforestation of eucalyptus is not recommended due to its water usage and soil degrading characteristics.

Table 1 Results of the COFAV restoration campaign for the period 2020 – 2021

 Community-based organizations (CBO)	 Place	 Commune ¹	 Hectares restored	 Seedlings planted (No.)
Vehivavy 8 mars Ikongo Eglise EKAR	Ankosinoro, Mangarivotra	Ikongo	1.7	1,500
Tsaramandroso	Ambohimana	Ambohimana	2	2,025
Iapombosoa Mahasambatra	Iapombo	Moroteza	3.8	3,801
Ravinala association	Fotobohitra	Kianjavato	6.4	5,735
Marohala association	Ambolomadinika	Ambolomadinika	2,700	3
Mahavonjy association	Ambinanitromby	Ambinanitromby	3.8	3 377
CBO Maneva	Antsatrana	Ikongo	0.3	260
CBO FIMAAMO, CBO Maitsoanala, Ass Tantsaha Mijoro	Tolongoina	Tolongoina	3.6	3,250
CBO FITEMA Vohiboay	Vohiboay	Miarinarivo	0.3	250
CBO 3FT	Ambatovaky	Androy	4.6	4,109
3 CBO dans la Commune d'Ivongo et d'Ivohibe	Ivohibe Nord, Sakaroa, Ambahatse	Ivongo et Ivohibe	4.2	3,800
		Total	33.6	30,807

¹ More details here: <https://www.conservation.org/gcf/projects/sustainable-landscapes-eastern-madagascar>

² Territorial district that corresponds to a city, a town with its villages and hamlets or a group of villages.

Forest corridor Ankeniheny-Zahamena (CAZ)

To mitigate the impacts of climate change, restoration and reforestation was implemented within the framework of the Sustainable Landscapes of Eastern Madagascar project funded by the Green Climate Fund. The approach was based on:

CONSULTATION

Consultation at the commune level with the involvement and participation of key local partners to identify reforestation sites to determine their ownership and to avoid problems/land disputes.

SKILLS & KNOWLEDGE

Development of local skills and knowledge to promote ownership of the restoration activity.

ROLES & RESPONSIBILITIES

Defining roles and responsibilities of stakeholders in implementation and monitoring.

SUPPORT

Methodological, logistical and financial support.

Table 2 Nursery sites and plant numbers

Nursery sites	Plants (No.)
Ambalafary 1	6,800
Ambalafary 2	5,500
Didy 1	3,500
Didy 2	1,500
Fierenana 1	9,700
Fierenana 2	8,600
Anjahamana	1,000
Andranobolaha	5,000
Raboana	1,200
Total	42,800

Table 3 Nursery sites and plant numbers

Plant types	Plants (No.) in Alaotra-Mangoro	Plants (No.) in Atsinanana
Cloves	965	52,061
Coffee	65,625	23,536
Vanilla leaves	0	38,220
Orange Trees	1,700	0
Total	68,290	113,817

2020 ACHIEVEMENTS



72 nursery persons (including 17 women) trained in 7 communes namely, Fierenana, Ampasimpotsy Gara, Didy, Andranobolaha, Anjahamana, Morarano Gara, Lakato



9 nurseries operating in 6 communes namely, Fierenana 2, Ampasimpotsy gara 1, Didy 2, Andranobolaha 1, Anjahamana 1, Morarano gara 1 (see table 2)



342.8 ha of forest restoration plots identified in 7 Communes namely, Lakato, Ampasimpotsy gara, Andasibe, Didy, Fierenana, Anjahamana, Andranobolaha



144.2 ha of agroforestry plots identified



181 ha of exotic plant reforestation plots identified

In addition, purchases and distribution of clove, coffee, orange, and vanilla plants were also made (see table 3) for the implementation of the following agroforestry activities:



68,290 seedlings for 2 women's associations and 20 CBOs in the **Alaotra-Mangoro region** (1 in Andasibe; 2 in Beforona; 1 in Ampasimpotsy Gara; 8 in Didy; 3 in Fierenana; 4 in Morarano gara; 1 in Lakato)



113,817 seedlings for 19 CBOs in the **Atsinanana region** (6 in Anjahamana; 4 in Andranobolaha; 3 in Maroseranana; 1 in Fetraomby; 1 in Fito; 1 in Satrandroy; 1 in Ambodilazana; 2 in Antenina)

3

7 Bays Marine Corridor (7BMC)

In Madagascar's Marine Protected Area network, the **Ampondrahazo** area has the largest mangrove area of extraordinary ecological and socio-economic importance. While the restricted mangrove areas of **Ivovona** have an insignificant importance in terms of coastal protection and bio-nursery. However, these mangrove forests also have degraded plots caused by charcoal burning and cutting that took place before they were protected. These mangroves are part of the proposed tourist routes, therefore it is necessary to maintain the integrity of these ecosystems to ensure ecotourism continues.

THE RESTORATION OF MANGROVES IN AMPONDRAHAZO, IVOVONA, AMBAVARANO AND COASTAL FOREST OF IVOVONA /

The objective is to restore the degraded mangroves regardless of the cause of degradation (i.e. natural or anthropic) so that the ecosystem can improve its ecological functions and simultaneously provide long-term ecosystem services. Given the Government's reforestation commitment, this activity is becoming more intensive. Experts determined the surface area that needed to be restored. Upstream areas and nearshore forests around the sites were also restored to consider the natural infrastructure from upstream to downstream.

The restoration was implemented in collaboration with the NGO Graine de Vie and the Regional Representative of the Ministry of Environment and Sustainable Development, with the participation of local communities, including CBOs and associations such as women and farmer associations.



In 2018, **10,000** mangrove pods covering **11 ha** were restored and distributed in three sites namely, Ivovona, Ampondrahazo and Ambavarano.

Before the COVID-19 pandemic from 2018 to 2020, a mangrove reforestation program was carried out in three villages (Ivovona, Ampondrahazo and Ambavarano) and the coastal forest in Ankijàmazava, Ivovona. The results are:

IVOVONA

In collaboration with the NGO Graine de Vie, **60 kg** of nanto seed (*Mimusops boeniensis*) were planted on **5 ha** of (terrestrial) land with the participation of the communities of Ivovona village.

5,000 cuttings of *Rhizophora mucronata* were planted in Matsatsolaoko, Ivovona with the participation of school students and management committees.

AMPONDRAHAZO

50,000 cuttings of *Bruguiera gymnorrhiza* were planted on **5 ha** of land in Ampondrahazo, with the participation of stakeholders such as the Region of DIANA, DRPEB, DREDD, Graine de Vie, ONG C3, students of Ampondrahazo and Ambavarano schools and the communities of these two villages.

AMBAVARANO

20,000 cuttings of *Bruguiera gymnorrhiza* were planted on **2 ha** of land with the participation of school students and the communities of Ambavarano.

SUMMARY OF ACHIEVEMENTS FOR 7BMC /

Mangrove restoration:	Mangrove restoration:	Terrestrial planting:
10 – 15 ha/year	60 ha from	5 ha in
from 2016 to	2019 to	2020
2018	2020	

NEW MANGROVE RESTORATION GOAL FOR 2023 to 2025:

150 ha/year

CONCLUSION

For the sites managed by CI Madagascar, restoration is a very important activity under the governance of protected areas.

	COFAV	CAZ	7BMC
Restoration activities	<ul style="list-style-type: none"> • Improve awareness of local communities on the importance of reforestation and restoration. • Support and supervise beneficiaries on the mobilization and organization of community reforestation work. • Set up local nurseries to be owned by local communities 	<ul style="list-style-type: none"> • Intensify the training of nurserypersons provided by CBOs and associations. • Establishment of nurseries by CBOs and associations benefiting from the adaptation support is very important. • Promote the production of useful plants in nurseries to meet daily needs. 	<ul style="list-style-type: none"> • Restoration is focused on mangroves that could be done in an extended period
Challenges	<ul style="list-style-type: none"> • Local communities have not met their reforestation goals 	<ul style="list-style-type: none"> • Unavailability of native species to be established in nurseries • Sometimes nurserypersons lacked motivation 	<ul style="list-style-type: none"> • COVID-19 restrictions on fieldwork delayed the planned schedule.
Restoration impact	<ul style="list-style-type: none"> • Restoration increases the vegetation cover. For example, the deforestation rate progress in year 2019/2020 was 1.12% and in 2020-2021 was 0.46%. 	<ul style="list-style-type: none"> • Local communities including women, have taken an interest in the indigenous species nurseries. • Women have become actively involved in the restoration process. • Local authorities are motivated to implement reforestation activities to achieve the Government's goal to regreen Madagascar. 	<ul style="list-style-type: none"> • All people (including men, women, and youth) recognize the importance of mangrove restoration for the improvement of their fishery production (shrimps and crabs mainly) and are actively involved in mangrove restoration.



© Conservation International